REMARKS

Claims 1-27 are of record in this application. Claims 1 and 10 have been amended and new claims 26 and 27 have been added. No claims have been canceled.

Support for the amendments is inherent in the original disclosure. Claims 1 and 10 have merely been amended in an attempt to use consistent terminology and avoid confusion. Thus, the term "insects" has been replaced with "pests" which is recited in the preamble of claim 1 and throughout the dependent claims. New claims 26 and 27, limited to tick pests, are supported by original claims 6 and 9 and the specification at paragraph no. 0021.

Information Disclosure Statement

Applicants have submitted herewith an accompanying Information Disclosure Statement. Four references are cited therein. Three of these four references, *i.e.*, Pape-Lindstrom & Lydy (1997), Belden & Lydy (2000), and Belden & Lydy (2001) are discussed at length hereinbelow.

The Examiner's attention is directed to the fourth cited publication, Lichtenstein *et al.*, published 1973 in the journal, Science, which has only recently come to Applicants' attention.

In brief, Lichtenstein *et al.* studied the effects of several herbicides, including atrazine and simazine, on a variety of insecticides (including the organophosphate insecticides parathion and diazinon) which were commonly available at that time. The authors disclosed that atrazine significantly increased the toxicity of parathion against fruit flies (*Drosophila melanogaster*), houseflies(*Musca domestica* L.), and mosquito larvae(*Aedes aegypti* L.). Similar results were seen with atrazine and other organophosphate insecticides against the fruit fly. See Tables 1 and 2, and page 849, therein.

Rejection Under 35 U.S.C. 103

Claims 1-25 have been rejected under 35 U.S.C. 103 as being unpatentable over the combination of Geizler-Jones and SIUC. The Examiner has taken the position that both references disclose the enhancement of organophosphate (OP) insecticide activity by atrazine, and thus it would have been obvious to combine the two and "to recognize the species of insects which would be subject to control by the OP insecticides, and which animal species would be protected thereby." Applicants respectfully disagree.

Geizler-Jones is a biweekly internet posting published by the Office of University Communications for Wichita State

University (see the bottom of the printed web page). This posting describes a variety of University-related events, and occasionally includes stories describing research activities of faculty at the University. The posting in question, falls in the latter category, and was prepared by Amy Geizler-Jones of the Office of University Communications, and was published online on May 11, 2000. The article describes the research activities of Mike Lydy, then a faculty member of Wichita State University, specifically his studies of the pollution of the Arkansas and Little Arkansas Rivers. The article refers to Dr. Lydy's finding that atrazine significantly increases the toxicity of organophosphate (OP) insecticides (page 2).

SIUC is another internet posting, this by the Fisheries and Illinois Aquaculture Center of Southern Illinois University at Carbondale. This posting was apparently made in the year 2001 or later (see the Copyright notice at the end of the print copy). The posting describes various research projects by the same Dr. Mike Lydy referred to in Geizler-Jones (see the title at the top of the print copy). Item no. 4 describes Dr. Lydy's research on the effect of atrazine on OP insecticide toxicity against larvae of the water midge, *Chironomus tentans*.

The instant invention is drawn to a method and compositions for controlling economically important ticks and blood-feeding flies. Applicants have discovered that combining a cytochrome P450 monooxygenase inducer with an organophosphate (OP) pesticide (insecticide or acaracide) provides effective control of these ticks and flies, and particularly against OP-resistant strains of the ticks and flies. In use, a pesticidally effective amount of a composition of the cytochrome P450 monooxygenase inducer and OP pesticide is applied to the locus of the targeted tick or fly. This is not disclosed or suggested in the prior art relied upon.

Because Geizler-Jones is merely a very brief overview of the research of Dr. Lydy, and was not even written by Dr. Lydy but by an employee of Wichita State University, to more fully understand the extent of the teachings of this reference it is necessary to examine the work of Dr. Lydy himself. In this regard, Dr. Lydy indeed has several scientific publications related to his work studying the effects of the combination of atrazine with OP insecticides. Applicants' representative has found three publications co-authored by Dr. Lydy which relate to this study, specifically:

- Pape-Lindstrom and Lydy, 1997, *Synergistic Toxicity of Atrazine and organophosphate insecticides Contravenes the Response Addition Mixture Model*, Environmental Toxicology and Chemistry, 16(11):2415-2420.

- Belden and Lydy, 2000, *Impact of Atrazine on Organophosphate Insecticide Toxicity*, Environmental Toxicology and Chemistry, 19(9):2266-2274.
- Belden and Lydy, 2001, *Effects of Atrazine on Cholinesterase Activity in Midges (Chironomus tentans) exposed to Organophosphorous Insecticides*, Chemosphere, 44:1685-1689.

Copies of each of these publications are provided in the accompanying Information Disclosure Statement. Upon review of Dr. Lydy's publications, it is readily apparent that Dr. Lydy's work is limited to the effects of atrazine and OP insecticides on a single insect, the water midge, *Chironomus tentans*. All of the Dr. Lydy's scientific publications disclose that atrazine synergistically increases the toxicity of OP insecticides against the water midge. None of the references disclose or suggest that atrazine increases the activity of OP insecticides against ticks or any other insect species, much less insects in general.

Applicants respectfully submit that the disclosure in the prior art that atrazine increases the toxicity of OP insecticides against a single insect species (*i.e.*, the water midge), would not lead a practitioner of ordinary skill in the art to reasonably expect that atrazine would increase the toxicity of OP insecticides against ticks or all insects, much less the instantly claimed ticks and flies. Moreover, the disclosure of the prior art would not provide any motivation for the skilled

practitioner to apply the combination of atrazine and OP insecticides against ticks and other economically important insects.

The CAFC and CCPA have clearly held that obviousness requires that the prior art provide at least some predictability or a reasonable expectation of success of the claimed process. See *In re Gangadharam* (CAFC 1989) 13 USPQ2d 1568, *In re Whiton* (CCPA 1970) 164 USPQ 455, and *In re Rinehart* (CCPA 1976) 189 USPQ 143. However, contrary to the Examiner's conclusion, there would be no predictability or expectation that a composition of atrazine or any other triazine with an OP insecticide would be effective against ticks or flies. In the absence of such a reasonable expectation of success, there would be no motivation for the skilled practitioner to modify the teachings of the references as suggested by the Examiner.

As shown by Metcalf and Flint (Destructive and Useful Insects, fourth edition, McGraw-Hill, New York, 1962, pp. 180-187, a copy of which is enclosed), insects belong to the taxonomic class *Hexapoda* (*Insecta*) and are divided between 26 orders (that is, in the classic classification system of phylum › class › order › family › tribe › genus › species). Ticks, which belong to the class *Arachnida*, are not even insects, but are

classified in the same class as spiders and scorpions. Of the insects, as long ago as 1962 there were over 680,000 known species of insects, with the likely numbers into the millions (page 180, Table 6.2, and the paragraph bridging pages 184-185).

Looking first to the instant method claims, and specifically the treatment of flies, the order of *Diptera*, which includes the water midge of Lydy as well as flies, is described by Metcalf as comprising a very diverse group of over 85,000 species which vary widely in their habits and most characteristics (Table 6.3, page 187, and page 202). Within this order, the water midges, such as those referred to by Lydy, belong to the taxonomic family *Chironomidae* (page 299), while the instantly claimed flies belong to a variety of different taxonomic families (with the blood feeding flies of claims 7 and 9 belonging to the family *Muscidae*). No flies are included with the water midges of Lydy in the family of *Chironomidae*. Thus, the instantly claimed flies are taxonomically far-removed from the water midges of Lydy.

In view of the large number and diversity of species of insects within the order *Diptera*, and particularly considering that the flies are not closely related to the water midges as demonstrated by their classification in different families, Applicants submit that a practitioner of ordinary skill in the

art would have no reasonable expectation that all insects, including flies, would exhibit the same increased susceptibility to OP insecticides when combined with atrazine as the water midges of Lydy.

Applicants submit that the skilled practitioner would have even less reason to expect that atrazine would increase the toxicity of OP insecticides to ticks. Again, as disclosed by Metcalf at pages 180 and 181, ticks are not even insects but belong to the taxonomic class *Arachnida* (insects belong to the class *Hexapoda*). Thus, the skilled practitioner, having the prior art of record before them, would have even less reason to expect that the findings of Lydy with respect to one insect, the water midge, would also be applicable to ticks.

In addition to the arguments above, Applicants further note that the prior art of record, and Lydy specifically, were drawn to disclosures of the harmful effects of atrazine being present with OP insecticides on aquatic environments. The water midge of the prior art was not considered a pest. The authors did not disclose or suggest applying combinations of atrazine with OP insecticides to control harmful ticks and insects. Again, a practitioner of ordinary skill in the art having the disclosure that atrazine and OP insecticides harm the benign water midge,

would have no motivation to formulate atrazine and OP insecticides for the purpose of applying this combination to control harmful ticks and insects.

Turning to composition claims 25 and particularly 20, drawn to specific combinations of triazines with OP insecticides, none of the claimed combinations are disclosed by the prior art. Applicants submit that the prior art of record would provide no motivation which would lead a skilled practitioner to prepare these compositions. As above, a practitioner of ordinary skill in the art having the disclosure that atrazine and OP insecticides harm the environment, would have no motivation to formulate atrazine and other triazines with OP insecticides for the control of harmful ticks and insects.

A copy of the Metcalf reference cited hereinabove is enclosed. It has <u>not</u> been supplied with an Information Disclosure Statement (with its accompanying fees) or listed on a form PTO-1449 because it does not: (1) establish a prima facie case of unpatentability, or (2) refute any position taken by applicants, as defined by 37 CFR 1.56(b).

For the reasons stated above, claims 1-27 are believed to distinguish over the prior art of record. Allowance thereof is respectfully requested.

Respectfully submitted,

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Enclosure
-Metcalf and Flint (Destructive and Useful Insects, fourth edition, McGraw-Hill, New York, 1962, pp. 180-187 and 292-312.